UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

75-02

DESCANSO R.D.

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REPLY TO: 5230 Forest Insect Evaluation May 19, 1975

SUBJECT: Bark Beetle Suppression

TO: Forest Supervisor
Attn: Dave Jones

Attached are the forms and information requested by the R.O. This was done without the benefit of the Biological Evaluation the R.O. was to send us. Due to the time factors I felt it best to proceed without it. I feel the information is correct. Please note blank for the addition of estimated dead trees on Page 1, of the Environmental Impact Evaluation. Suggest R.O. fill in this number before sending it to Washington D.C.

for George E. Lottritz

GEORGE A. LOTTRITZ
Resource Officer

ENVIRONMENTAL IMPACT EVALUATION
JULIAN-CUYAMACA ZONE OF INFESTATION
LAGUNA MOUNTAIN PROJECT
CLEVELAND NATIONAL FOREST
SAN DIEGO COUNTY

INTRODUCTION

The timber stand on the Laguna Mountains currently harbors a high population of California flatheaded borer in Jeffrey pine. Populations of pine engraver beetles in Jeffrey pine and western pine beetles in Coulter pine are at a low level. An estimated dead or dying pine on 9,350 acres are infested with one or more species of the beetles. At present the best method to attain suppression is through maintenance control. One part of maintenance control is direct control, i,e., the infested trees will be logged, removed by woodcutters or felled and sprayed with an insecticide.

In large infestations, the best method to suppress the beetle populations is by removal of infested material through logging and fuelwood cuts. Large volumes of infested material are removed, treatment expenses are kept low and need for chemical control is minimized.

Infested trees adjacent to structures and in or near campgrounds or other special or high-use sites do not lend themselves well to removal through logging or fuelwood cuts. Yet these infested trees, though only a small percentage of the total, are precisely those with the highest priority for control because of their proximity to other high-value uninfested pine. Chemical treatment with an insecticide is best suited for these problem areas. The insecticide lindane is registered and recommended by the Forest Service for California flatheaded borer and bark beetle control in California. Individual infested trees are felled, bucked and limbed and the bark sprayed with a 1.5 percent solution of lindane and diesel oil.

This evaluation primarily discusses the impact of the lindane-diesel oil treatment on the environment when used to treat insect-infested trees.

I. ENVIRONMENTAL IMPACT

Lindane spray will be applied in low dosages to individual felled trees. Lindane-diesel oil forms a tissue deposit (no lindane on bark surface), so environmental contamination will be kept to a minimum. One of the major concerns of organochlorine compounds, such as lindane, is that it may be transferred in the food chain through a phenomena called biological magnification. Dr. Francis Gunther (personal communication, Branch of Pest Control, Region 5), Chemist and Toxicologist, at the University of California,

(Riverside) stated that he knew of no instances where lindane went through biological magnification. Dr. Gunther is the editor of the 1970 edition of Residue Reviews and a renowned authority on insecticides. Macek (1970) said that lindane and methoxychlor would not be expected to be biologically magnified to any great degree.

A. Air

Lindane is stable to air, light, heat, and carbon dioxide. (Martin, 1968) No air pollution should occur through treating felled trees with a lindane-oil solution.

B. Natural Beauty

Much of the area is visible from roads, trails, and lakes. Because of the small number of trees to be felled the visual impact will be negligible. Slash created by insect control work will be handled in a manner that is consistent with the objectives of the Ranger District Multiple Use Plans and the Sub-Regional Guidelines. The removal of sorrel, and red-top trees from near and distant view areas will enhance the natural beauty, not detract.

C. Range and Plant Life

Lindane is considered to be nonphytotoxic at insecticidal dose levels.

D. Soils

With proper application procedures, very little of the lindane-oil solution should reach the soil. Lindane is moderately stable in soil and is fairly resistant to removal from the site of application by physical factors. (Lichenstein, 1959) Also, lindane degrades in soil to pentachlorocyclohexene (PCCH) which is more volatile than lindane, and does not remain in the soil to any extent. (Guenze, 1970)

E. Water

There are three small lakes in the actual project area and only a few intermittent streams. However, no infested trees will be felled in these stream courses. Lindane has very little movement in the soil, hence, there should be no effect on water quality or stream flow.

F. Fish and Wildlife

With the low dosage and direct application only to the bark or felled trees, no effect on fish and wildlife is expected.

Fish. Generally most insecticides are toxic to fish. The chlorinated hydrocarbons are particularly toxic. However, lindane is considered to be one of the safer chlorinated hydrocarbons. (O'Brien, 1967)

Brown and rainbow trout were all killed by exposure to 0.05 ppm lindane, but bluegills have survived 0.45 ppm of 12 percent lindane. However, bass and bluegill fingerlings suffered 50 percent mortality at 0.1 ppm of the same formulation. (Rudd, 1956) Four species of fish were exposed to water containing 0.03 ppm lindane. Two days after termination of exposure, the fish had eliminated 90 percent of the lindane. (Gakstatter and Weiss, 1967)

Birds. Numerous tests have been made feeding various birds on a diet of certain percentages of lindane. A 10 percent mortality of pheasants resulted from eating grain treated with one and two-thirds ounces of 75 percent lindane per 100 pounds over a 20-day period. However, other investigators were unable to detect noteworthy changes in the bird population of a 40-hectare pasture and woodland treated with 10 percent BHC (10 percent gamma) at approximately 50-70 pounds per acre. This application is about twice that normally employed. In addition, considerable field observation and experimentation in Germany have led essentially to the same conclusion. The small amounts of BHC that a wild bird could ingest would be insufficient to cause harm, due to the rapid disintegration of the material (BHC) within the animal body. (Rudd, 1956)

In summary, the National Academy of Sciences (1969), indicates that field applications of lindane have no toxic effect on birds.

Animals. The chronic toxicity of BHC, with the exception of the beta isomer (this isomer not in lindane) is relatively low. Technical BHC and lindane have been rated as one half and one quarter, respectively, the toxicity of DDT. Minimal storage, rapid elimination from the body and lesser degree of tissue damage are the criteria for this rating. (Lehman, 1950)

According to the National Academy of Sciences (1969) mammals metabolize lindane quite rapidly to trichlorobenzenes and phenols, which are excreted, and thus accumulate very little in the body fat. Hence, in mammals it has a low oral toxicity. (O'Brien, 1967)

G. Man

The U.S. Department of Health, Education and Welfare reports that there have been no confirmed cases of systemic poisoning in man as a result of repeated exposure to BHC (comparable to lindane). A Roumanian study showed no ill effects from massive inhalation of DDT plus lindane in a forest spraying operation; some workers inhaled 21 mg/kg of DDT as well as 6 mg/kg of lindane daily for 30 days. (O'Brien, 1967) Lindane is absorbed through the skin and other portals. Lindane has the highest mammalian toxicity but is

also excreted by the kidneys and hence, does not accumulate extensively. It therefore has the lowest toxicity on repeated dosages. (Hayes, 1963)

H. Wilderness Areas

There are no wilderness areas in the project.

II. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

A temporary reduction of certain beneficial and associated insects as well as some soil arthropods is probable. Two common predators of the western pine beetle, Enoclerus lecontei and Temnochila chlorodia, are quite easily killed by lindane. (Swain, 1968)

III. ALTERNATIVES TO THE PROPOSED ACTION

A. Log Infested Trees

This method is very desirable in low use areas but difficult in recreation and heavily urbanized areas. Nevertheless, an extra effort will be made to log infested trees in fiscal 1976.

B. Removal of Infested Trees by Woodcutter

Usually only a small number of trees can be handled in this manner as it is difficult to remove the trees before insect emergence. Another problem is that the infested material must be removed from the forest environment if the treatment is to be effective. Hence, this precludes the use of local woodcutters.

C. Fell, Peel and Burn Infested Trees

The fire hazard in southern California generally will not permit this type of treatment. Also, the effects of charred debris and scorched vegetation is undesirable in most of the areas. Local Air Pollution Control Board ordinances prohibit burning in some areas.

D. Use Ethylene Dibromide Instead of Lindane

Ethylene dibromide is a fumigating insecticide and has limited effectiveness, particularly in cold weather. Because of its short residual life it will not protect the uninfested portions of treated trees from attack by forest insects. Ethylene dibromide poses a greater hazard to treatment crews than does lindane as it is notorious for causing skin irritations resulting from direct contact. Breathing its fumes causes lung irritation.

E. Discontinue Insect Control Work in the Area

This should be regarded only as a theoretical alternative as it would have an intolerably adverse effect on the land value and the forest resource that people value for temperature modification, recreation, esthetics, shade and timber production.

IV. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

There are no irreversible commitments except the finality of cutting a tree which would soon become a snag. Some snags always remain for wildlife habitation. Also, tree regeneration may take place in areas where trees have been cut.

V. CONSULTATION WITH OTHERS

There is consultation on a special and continuing basis with State agencies, institutions of high learning, and other Federal agencies as well as Forest Service personnel. Some of the agencies involved are the California Department of Food and Agriculture, California Division of Forestry, California Department of Fish and Game, Fish and Wildlife Service, and Pacific Southwest Forest and Range Experiment Station. Institutions consulted include San Diego State University and the University of California at Berkeley and Riverside.

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Rudd, Robert L., and Genelly, Richard E. 1956. Pesticides: Their Use and Toxicity in Relation to Wildlife, Game Bulletin No. 7, Department of Fish and Game.

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USDA FOREST SERVICE

PROJECT PROPOSAL

Forest Insect & Disease Control

1. REG. OF AREA	4. STATE
5	CA

2. CAUSAL AGENT: Mc, Db, Ips

3. GROUP

5. CALENDAR YR.

6. TYPE OF PROJECT (Mark one)
- ☐ NATIONAL FOREST
- ☐ S & P COOPERATIVE
- ☐ OTHER FEDERAL

PROJECT NAME & LOCATION

8. UNIT

9. TREE SPECIES

PREVENTION OR SUPRESSION METHOD

11. PESTICIDE

12. DOSAGE RATE

13. EST. DUR. OF WORK

TYPE OF WORK	15. UNITS OF WORK	16. UNIT COST	17. TOTAL PLANNED COST	18. FUNDS NEEDED BY PERIODS			
				FY 19 ____ JAN 1 – JUNE 30		FY 19 ____ JUL 1 – DEC. 31	
				A. I & DC.	B. NonFed.	C. I&DC.	D. NonFed.
Presuppression Survey Acres	7200	.25	1800				
Acres to be treated	3000						
Trees to be treated	1000	12.00	12000				
Stumps to be treated	1000	.05	50				
MBM of infested trees to be logged							
Other							
Job Total →			13,850				
Indirect & Service Charges (Field)		% of (i)					
Total Field Costs →			13,850				

Proposed by → SIGNATURE: George Lottritz | TITLE: Resource Officer | DATE: 5/15/75

SPACE BELOW FOR REGION & AREA OFFICE USE ONLY

Region or Area Indirect & Service Charges →	% of (21)				
Total Project Cost Estimate →					

Evaluation Reports: ATTACHED ☐ CONTINUED PROJECT ☐ to be sent by (date) _____ | 23. PRIORITY | 24. PROJECT NO.

Approved by → SIGNATURE | TITLE | DATE

SPACE BELOW FOR W.O. USE ONLY

Approved by: INITIALS & DATE	Disapproved by: INITIALS & DATE	Deferred by: INITIALS & DATE

Funds Requested from:	1/1 – 6/30	7/1 – 12/31	TOTAL	Reason for deferment or disapproval
I & DC. W.O. Reserve				
I & DC. B. of B Cont.				
I & DC. Supplement				
NFRC				
I & M				
Total Financed				
Unfinanced due to:				
Deferment				
Disapproval				
Total Unfinanced				
Total Funds Requested				

(See instructions on reverse)

5200-10 (REV. 7/55)

BARK BEETLE SUPPRESSION PROJECT

Cleveland NATIONAL FOREST

Descanso DISTRICT

	30% RESIDENTIAL AREAS	50% DEVELOPED RECREATION AREAS	20% COMMERCIAL FOREST
	(1) Trees treated 180 x	(1) Trees treated 300 x	(1) Trees treated 120 x
	(2) Rate of infestation increase 2X =	(2) Rate of infestation increase 2X =	(2) Rate of infestation increase 2 x
	(3) Potential tree loss without treatment 380 x	(3) Potential tree loss without treatment 600 x	(3) Average volume of infested trees .4M =
	(4) Average value per tree 375 = ($375 suggested)	(4) Replacement costs (a) Cost of regeneration establishment 5 (b) Lifespan of average tree killed 100 (c) Compound cost (4a) by 7% for lifespan at average tree killed (4b) 2560 =	(4) Potential volume loss without treatment 172 x (5) Current stumpage rate 2 =
otal Tree Value	135000 ÷	1,536,000 ÷	384 ÷
ppression Expense	2493 =	4155 =	1662 =
nefit/Cost Ratio	54 /1	370 /1	.23/1

Benefit/Cost Ratio for Total Area: 201 /1